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| **Text  Description automatically generated** | | | | | |
| **PT1/CHQP/1122/B 29-AUG-2022** | | | | | |
| **PERIODIC TEST - I (2022-23)** | | | | | |
| **Subject: CHEMISTRY**  **Grade: XI** | | Max. Marks:35Time:1 Hr 15 Mins | | | |
| **Name:** | | | **Section:** | **Roll No:** | |
| ***General Instructions:***  Read the following instructions carefully.  1. There are 16 questions in this question paper.  2. SECTION A - Q. No. 1 to 5 are mcq questions carrying 1marks each.  3. SECTION B - Q. No. 6 to 10 are short answer questions carrying 2 marks each.  4. SECTION C- Q. No. 11 to 15 are short answer questions carrying 3 marks each.  5. SECTION C- Q. No. 16 is a long answer question carrying 5 mark.  6. All questions are compulsory.  7. Use of calculators is not allowed | | | | | |
| **SECTION A** | | | | | |
| 1. | The energy of a photon of radiation whose frequency is 5x1014 Hz is   1. 6.626 x 10-34 J 2. 3.313 x 10-34 Js 3. 3.313 x 10-19 Js 4. 3.313 x 10-19 J | | | | 1 |
| 2 | Wavelengths of different radiations are given below:  λ = (A) 300 nm  λ(B)= 300 μm  λ (C)= 3 nm  λ (D) =30 A0  Arrange these radiations in the increasing order of their energies.   1. Λ(B)< Λ(A)< Λ(C) = Λ(D) 2. Λ(A)< Λ(B)< Λ(C) <Λ(D) 3. Λ(C)< Λ(A)< Λ(B) <Λ(D) 4. Λ(A)= Λ(B)< Λ(C) <Λ(D) | | | | 1 |
| 3 | Which postulate of the Dalton’s atomic theory was modified after the discovery of isotopes?   1. Matter consists of indivisible atoms. 2. All the atoms of a given element have identical properties including identical mass. Atoms of different elements differ in mass. 3. Compounds are formed when atoms of different elements combine in a fixed ratio. 4. Chemical reactions involve reorganization of atoms. These are neither created nor destroyed in a chemical reaction | | | | 1 |
| 4 | A solution contains 49 g H2SO4 in 100 cm3 of solution. Calculate the concentration of the solution in moles per litre.   1. 0.5 M 2. 0.1 M 3. 1 M 4. 5 M | | | | 1 |
| 5 | One mole of any substance contains 6.022 × 1023 atoms/molecules. Number of molecules of H2SO4 present in 100 mL of 0.02M H2SO4 solution is \_\_\_\_\_\_.  a) 12.044 × 1020 molecules  b) 6.022 × 1023 molecules  c) 1 × 1023 molecules  d) 12.044 × 1023 molecules | | | | 1 |
| **SECTION B** | | | | | |
| 6 | Carbon and oxygen are known to form two compounds. The carbon content in one of these is 42.9% while in the other is 27.3%. Show that this data is in agreement with the law of multiple proportions. | | | | 2 |
| 7 | If possible, what is a likely energy level for a hydrogen atom with  En= -6.053 X 10-20 J? | | | | 2 |
| 8 | What are the frequency and wavelength of a photon emitted during a transition in the Balmer series from n=4 state in the hydrogen atom? | | | | 2 |
| 9 | A compound with molar mass 180g/mol contains C, H and O in the molar ratio 1:2:1. What are its empirical and molecular formulae? | | | | 2 |
| 10 | A mixture of 100g of H2 and 100g of O2 is ignited to form water. Identify the limiting reagent and calculate the amount of water formed. | | | | 2 |
| **SECTION C** | | | | | |
| 11 | 1. Differentiate between absorption and emission spectra. (2 points) 2. Calculate the radius of 1st orbit of He+. | | | | 3 |
| 12 | 1. A hypothetical electromagnetic wave is shown in the figure below. Find out the wavelength of the radiation.      1. Chlorophyll present in green leaves of plants absorbs light at 4.620 × 1014 Hz. Calculate the wavelength of radiation in nanometer. Which part of the electromagnetic spectrum does it belong to? | | | | 3 |
| 13 | The electron energy in Hydrogen atom is given by  En = -2.18 X 10-18 J.  n2  Calculate the energy required to remove an electron completely from the n=2 orbit. What is the longest wavelength of light in cm that can be used to cause this transaction? | | | | 3 |
| 14 | Commercially available conc. HCl contains 38% HCl by mass.  a) What is the molarity of this solution? The density is 1.10 g/ml.  b) What volume of conc. HCl is required to make 1.00 L of 0.10 M HCl? | | | | 3 |
| 15 | 50g of Na2CO3 is treated with 200ml of M/5 solution of HCl. Find out the volume of CO2 evolved at S.T.P. Which substance is acting as the limiting reagent? | | | | 3 |
| **SECTION D** | | | | | |
| 16 | 1. A sugar syrup of weight 214.2 g contains 34.2 g of sugar (C12H22O11). Calculate:   (i) molality  (ii) Mole fraction of sugar in the syrup   1. Calculate the mass of methane gas required to produce 5.5g of carbon dioxide after combustion. 2. Why is molality considered better for expressing the concentration as compared to molarity? | | | | 5 |

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